

Please add the following new claims:

23. A method of controlling fungal diseases in plants comprising the step of applying to said plants a fungicide made according to the process of claim 9.

24. The method of claim 23, wherein the fungicide is colloidal copper citrate.

25. The method of claim 23, wherein the fungicide is colloidal copper citrate solution containing about 50 mg/L copper.- -

REMARKS

Claims 1 and 9 have been amended to include that R can be an aromatic group as well as hydrogen. Support for these amendments is found at paragraph 42 on page 10. Claims 1 and 9 have also been amended to clarify that the purifying step includes adding an oxidizing agent and phosphoric acid. Support for these amendments is found throughout the specification at, for example, page 10, paragraph 43 and Example 1 at paragraph 51. Hydroxide has been added as a possible anion for "A". Support for this amendment is found at page 13, Example 8. Claims 1, 3, 4, 6, 7, 9-12, and 14-15 have been amended to correct various grammatical errors. Claims 18, 20, and 22 have been re-written as Claims 23-25. Accordingly, no question of new matter arises and entry of the amendments is respectfully requested.

Claims 1-17, 19, 21, and 23-25 are before the Examiner for consideration.

Objection to Claims 19 and 21

On page 2 of the Office Action, Claims 19 and 21 have been objected to as not immediately following the claim from which it depends. To facilitate prosecution of this

application, Applicants have canceled Claims 18, 20, and 22 and re-written them as Claims 23-25. As amended, the claims immediately follow the claims on which they directly depend. Therefore, reconsideration and withdrawal of this objection is respectfully requested.

Rejection under 35 U.S.C. §112, first paragraph

On page 2 of the Office Action, the Examiner has rejected Claims 1-18 under 35 U.S.C. §112, first paragraph, for lack of enablement. In particular, the Examiner asserts that the specification does not provide enablement for anions in general because there is only a limited number of working examples of anion “A” and none of anion “B”.

Applicants respectfully traverse in view of the following remarks.

Initially, Applicants submit that there is an example set forth in the specification where anion “B” is present in the colloidal compound. Specifically, Applicants respectfully direct the Examiner’s attention to Example 8 on pages 13-14 for $\text{Cu}_2(\text{OH})\text{citrate}$. $\text{Cu}_2(\text{OH})\text{citrate}$ is equal to $\text{Cu}_2(\text{OH})(\text{C}_6\text{H}_5\text{O}_6)$. Thus, anion “A” is hydroxide and anion “B” is citrate.

Furthermore, contrary to the assertions in the Office Action, the specification does in fact provide sufficient guidance to enable one of ordinary skill in the art to identify members of possible anions that can be used in the formation of colloidal copper. It is submitted that the identification of anions that would produce colloidal copper can be performed without undue or unreasonable experimentation. The process of identifying the possible anions that can be used is not a particularly difficult or time consuming process. In fact, such identification processes are commonly and routinely performed by practitioners in the field. It is well established that a considerable amount of experimentation is permissible, if it is merely routine, or if the specification provides a reasonable amount of guidance with respect to the direction in which the

experimentation should proceed. In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). Moreover, even if such experimentation is complex, it does not necessarily make it undue, if the art typically engages in such experimentation. In re Certain Limited-Charge Cell Culture Microcarriers, 221 USPQ 1165, 1174 (Int'l Trade Comm'n 1983), Massachusetts Institute of Technology v. A.B. Fortia, 774 F.2d 1104 (Fed. Cir. 1985). The ease in carrying out experiments to achieve the identification of the species of anions capable of producing colloidal copper is a factor that favors the enablement of the claimed process and composition. Time and difficulty of experimentation are not determinative if they are merely routine. Accordingly, Applicants respectfully submit that the present invention is sufficiently enabled and respectfully request that this rejection be reconsidered and withdrawn.

Rejection under 35 U.S.C. §112, second paragraph

On page 3 of the Office Action, Claims 1-22 have been rejected under 35 U.S.C. §112, first paragraph, as being indefinite. Specifically, the Examiner notes that there is a period after $0 \leq y \leq 2$. Applicants have amended independent Claims 1 and 9 to remove this extra period. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Rejection under 35 U.S.C. §102(b)/103(a)

On pages 3-4 of the Office Action, the Examiner has rejected Claims 1-10 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over Brasch (U.S. Patent No. 4,681,630). In particular, the Examiner asserts that Brasch discloses a colloidal copper prepared from copper sulfate pentahydrate and method for preparing the same that falls within the scope of the claims. The Examiner specifically refers to Example 4.

Applicants respectfully traverse this rejection in view of the following remarks.

Brasch discloses the formation of a copper colloid prepared by dissolving copper sulfate pentahydrate in warm water. Type A gelatin is then added to the copper sulfate solution and the pH is adjusted to about 2.5 with 25% sulfuric acid at 90 F. Next, dimethylene borane is added with agitation. The resulting solution is allowed to react overnight for 24 hours without stirring or applied heat. Over the 24 hour period, the solution cools to room temperature.

Applicants submit that the process taught in Brasch is not the same as the present invention and that Brasch does not teach or suggest the process and product produced by the process disclosed and claimed by Applicants. For example, as amended, the process of the present invention includes a purifying step that adds an oxidizing agent and phosphoric acid to the copper sulfate solution. Such a step is neither taught nor suggested within Brasch. The purifying step of the present invention removes impurities such as ferrous, ferric, and aluminum ions that destabilize the resulting colloidal particles. (See specification at, e.g., paragraph 43). As a result, the process of the present invention forms a colloidal copper that is stable. In Brasch, gelatin is added as a stabilizing agent. In fact, Brasch teaches that the most advantageous stabilizing agent is gelatin. (See column 7, line 40). Thus, one of ordinary skill in the art reading Brasch would be motivated to use gelatin as the stabilizing agent and not to experiment and discover that purifying the copper sulfate solution would stabilize the normally unstable colloidal copper. Therefore, by teaching that gelatin is the most advantageous stabilizing agent Brasch actually teaches away from the process of the present invention.

In addition, after the purification step, the cupric solution of the present invention is adjusted to a pH of about 5 by a base, i.e., the pH is raised. (See paragraph 47). This step is also not taught or suggested in Brasch who teaches that the pH is lowered to pH 2.5 by sulfuric acid.

(See column 7, lines 45-46).

Further, in inorganic chemistry, the oxidation number of an element can play a crucial role in how the element reacts under certain conditions. For example, elemental sodium (Na^0) reacts explosively with water, whereas a sodium ion (Na^+) dissolves in water. In Example 4, Brasch describes a metallic Cu colloid (i.e., Cu^0). One skilled in the art would recognize that metallic Cu colloid particles are oxidized immediately under aerobic conditions. In order to prevent oxidation, Brasch uses a large amount of a reductant such as DMBA or hydrazine hydrate. On the other hand, the present invention is directed to Cu^{2+} compounds which react very differently and do not oxidize under aerobic conditions.

With respect to Examples 1-3 of Brasch, Applicants submit that the copper colloids prepared in accordance with U.S. Patent Nos. 3,958,048, 3,993,799, and 4,259,376 are a fine suspension of Cu^0 colloid for use in electroless copper plating, and are not true colloids as in the present invention.

In view of the above, Applicants submit that the present invention is not taught or suggested by Brasch and respectfully request that the Examiner reconsider and withdraw this rejection.

CONCLUSION

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

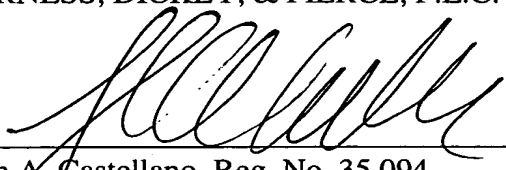
If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

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VERSION WITH MARKED-UP CHANGES

1. (Amended) A colloidal cupric compound of [the] formula (I):



[where] wherein A and B are anions,

$0 \leq x \leq 2$, [and]

$[0 \leq y \leq 2.]$ $0 < y \leq 2$,

[The relationship between x and y is further clarified by Equation II:] wherein R is selected from the group consisting of hydrogen and an aromatic group, and

$$mx + ny = 2; \quad [(\text{II})]$$

[where] wherein m and n are coefficients equal to oxidation numbers of the anion A and B, respectively,

the anion A [representing] is selected from the group consisting of Cl^- , Br^- , I^- , F^- , NO_3^- , SO_4^{2-} , PO_4^{3-} , OH^- , RCOO^- [where R is H], a C_1 - C_{20} straight chain hydrocarbon, [or] a C_1 - C_{20} branched hydrocarbon, [or] an aromatic group, tartrate²⁻, citrate³⁻ [or] and an amino acid residue;

the colloidal cupric compound made by a process comprising the steps of:

purifying a Cu^{2+} solution by adding an oxidizing agent and H_3PO_4 to the solution; and raising the pH of the solution.

3. (Amended) The colloidal cupric compound of claim 1, wherein [purifying the Cu^{2+} solution is performed by] said purifying step further includes the steps of:

[adding an oxidizing agent and H_3PO_4 to the solution;]

adjusting the pH to 3;

heating the solution; and
removing the solids.

4. (Amended) The colloidal cupric compound of claim [3] 1, wherein the oxidizing agent is [H₂O₂ or bleach] selected from the group consisting of H₂O₂ and bleach.

6. (Amended) The colloidal cupric compound of claim 1, wherein the process further comprises:

adding [the solution to] an organic solvent to the solution to form a precipitate; and
collecting the precipitate.

7. (Amended) The colloidal cupric compound of claim 6, wherein the organic solvent is selected from the group consisting of methanol [or] and acetone.

9. (Amended) A process for producing a colloidal cupric compound of [the] formula (I):



[where] wherein A and B are anions,

$0 \leq x \leq 2$, [and]

$0 \leq y \leq 2$ [and], and

[The relationship between x and y is further clarified by Equation II:]

$$mx + ny = 2, \quad \text{[(II)]}$$

[where] wherein m and n are coefficients equal to oxidation numbers of the anion A and B, respectively,

the anion A [representing] is selected from the group consisting of Cl⁻, Br⁻, I⁻, F⁻, NO₃⁻, SO₄²⁻, PO₄³⁻, RCOO⁻ [where R is H,] a C₁-C₂₀ straight chain, [or] a C₁-C₂₀ branched hydrocarbon, [or] an aromatic group, tartrate²⁻, citrate³⁻ [or] and an amino acid residue;
wherein R is selected from the group consisting of hydrogen and an aromatic group;

the process comprising:

purifying a Cu^{2+} solution[; and] by adding an oxidizing agent and H_3PO_4 to the solution; and
raising the pH of the solution.

11. (Amended) The process of claim 9, wherein [purifying the Cu^{2+} solution is performed
by:] said purifying step further includes the steps of:

[adding an oxidizing agent and H_3PO_4 to the solution;]

adjusting the pH to 3;

heating the solution; and

removing the solids.

12. (Amended) The process of claim [11] 9, wherein the oxidizing agent is selected from the
group consisting of H_2O_2 [or] and bleach.

14. (Amended) The process claim 9, wherein the process further comprises:
adding [the solution to] an organic solvent to the solution to form a precipitate; and
collecting the precipitate.

15. (Amended) The process of claim 14, wherein the organic solvent is selected from the
group consisting of methanol [or] and acetone.